

Appendix C

Preparation Guide for Facility Safety Procedures

This appendix prescribes the format and content of FSPs. To the extent possible, FSPs shall be written following the format given in the example that follows. An FSP outlines the methods for avoiding, controlling, and minimizing the environmental, safety, and health (ES&H) hazards and risks identified in safety analysis reports (SARs) and other ES&H evaluations (e.g., those given in Appendix B of this supplement and in Section 2.21 and Appendix 2-C of Chapter 2 of the *Health & Safety Manual*.) The preface shall be prepared as shown and must contain all the statements provided.

Editorial comments in this appendix are enclosed in brackets ([...]).

[Title of safety procedure]

Preface

Laboratory management requires that the controls specified in this facility safety procedure (FSP) be applied to efficiently and safely perform operations within this facility. Any operation conducted in this facility that does not conform to the requirements and provisions of the *Health & Safety Manual*, the *Environmental Compliance Manual*, and this FSP must be approved by an operational safety procedure (OSP) that specifically assesses the responsibilities, hazards, and controls necessary to conduct the operation safely.

This FSP was prepared by (signature):

Facility Manager

This FSP was reviewed by (signature):

Hazards Control
ES&H Team Leader

This FSP was approved by (signature):

Facility AD

Contents [Example]

[NOTE: As a minimum, the major topics listed below (i.e., Introduction, Responsibilities and Authorities, etc.) shall be included in every FSP. Additional topics may be required as determined by facility management and the ES&H team. The content and level of detail within each section is provided as a guideline and is *strictly dependent* on the operation of the facility, as determined in the review and approval process.

Only the main topic headings (e.g. Introduction, Responsibilities and Authorities, etc.) in the contents are numbered the same as in the guidelines on p. 22. Other applicable subheadings should be numbered in a similar manner as shown in the example (e.g., 1.1 Purpose, 1.2 Applicability, etc.)]

Preface

1. Introduction
 - Purpose
 - Applicability
 - Changes
 - Review
 - Administrative Control of the Facility
2. Responsibilities and Authorities
 - General
 - Associate Director
 - Deputy Associate Directors
 - Assurance Managers
 - Division Leaders
 - Facility Manager
 - Building Coordinator/Facility Associate
 - Area Supervisors
 - Responsible Individuals
 - Employees and Contract Personnel
 - ES&H Team
 - Environmental Protection Department
 - Health Services Department
 - WAA Coordinator
 - WAA Operator
 - Materials Management
 - Plant Engineering
3. General Building Policies and Control
 - Technical Safety Requirements (TSRs) and Operational Safety Requirements (OSRs)
 - Other ES&H Evaluations
 - Personnel Protective Equipment

3. **(Cont'd)**
 - Material Handling
 - Roof Access Controls
 - Working Alone
 - Egress
 - LLNL Laboratory/Shop/Experiment Close-Out Procedure
 - Control of Documents
 - Eating and Drinking in Laboratories and Work Areas
 - Fire Safety
 - Plumbing Cross Connections
 - Facility Modifications
 - Confined Space
 - Chemical Hygiene Plan
 - Waste Disposal Plans
- 4 Authorized Operations, and ES&H Hazards Analyses and Controls Integration
5. Training Requirements
 - Responsibility for Training
 - Training Records
 - Special Training Requirements
 - Required Reading
6. Maintenance, Inspection, and Quality Assurance of Safety Systems, Environmental Systems, and Equipment
7. Emergency Response Plan and Procedures
 - Injury, Illness, or Uncontrolled Hazards Condition
 - Evacuation Alarm
 - Fire Fighting
 - Hazardous Materials or Waste Releases
 - Radioactive Materials and Waste Releases
 - Emergency Controls
 - Notification of Accidents or Incidents, including Occurrence Reporting
 - Notification of Unsafe Conditions
8. References

Appendices

- A. Building Floor Plans
- B. List of organizations Operating in the Facility and Area Supervisors
- C. Emergency callout list
- D. Emergency response procedures
- E. Self-Help Plan [See Chapter 3 of the *Health & Safety Manual*.]
- F. Spill Contingency Plan
- G. [Other]

Guidelines for Each FSP Section

1. Introduction

[Use the following paragraph:]

This FSP describes the safety parameters for the operations in building ____ (the facility) [or building complex ____], the responsibilities and authorities of building personnel for ensuring safe operations, and operational hazards and environmental concerns and their controls. In addition, this FSP prescribes facility-specific training requirements, emergency controls, and maintenance and quality assurance requirements for ES&H-related building systems.

[Provide a brief description of the nature of the operations and a complete list of all the facilities covered by this FSP.]

2. Responsibilities and Authorities

2.1 General

[Identify the safety management chain for the facility. Specify the relationship between facility management and the various programmatic and/or organizational groups (user groups) operating in the facility. State who is responsible for implementing the controls specified in this FSP and who is responsible for oversight.]

2.2 (Continuing)

[The following sections should clearly identify the ES&H responsibilities and authorities for the Responsible Individuals and support groups.]

3. General Building Policies and Controls

3.1 Technical Safety Requirements (TSRs) and Operational Safety Requirements (OSRs)

[TSRs and OSRs (from a DOE-approved safety analysis) are safety limits on the conditions of operations and administrative and/or management controls required to assure safe operation of a facility. If applicable, this section shall summarize the safety limits and limiting conditions of operations for the facility (see Supplement 2.22). If no TSRs and OSRs are applicable to this facility, this section should state that fact.]

3.2 (Continuing)

[This section (see “Contents”) should provide general ES&H policies and controls that facility management has established for the facility (e.g., room or area access controls; roof access controls; rules for working alone and after normal working hours, eating and drinking in work areas, housekeeping, seismic anchoring of equipment; and requirements for safety evaluations of specific experiments).

Examples of access controls include

- visitor/escort requirements;
- advance notification of the Facility Manager for any new equipment, system, or operation that is brought into the area;
- a safety evaluation conducted by the area ES&H team, including a review by the environmental analyst for the area, for any new equipment, system, or operation that is brought into the area;
- a safety re-evaluation which may be required before relocating or modifying any potentially hazardous equipment, system, or operation (e.g., relocating a Class IV laser or high-voltage system to another laboratory or modifying an E-beam apparatus by installing a viewing window).]

4. Operations; ES&H Hazards Analyses and Control Integration

[The following format provides for listing all ES&H hazards in a single section and for integrating their controls into the same section. Existing FSP formats (with separate sections for health and safety hazards and controls, and for environmental hazards and controls), may be used indefinitely for future revisions (i.e., until the Program and the ES&H team agree that a complete rewrite is warranted).]

Operations authorized by this FSP, including their hazards and required controls, are listed below.

4.1 Normal Operations; Hazards and Their Controls

The hazards associated with operations and activities in the area(s) that are covered by this FSP or that are adequately addressed in the *LLNL Health & Safety Manual and/or Environmental Compliance Manual* and *LLNL Training Manual* are listed below.

[Identify the classes and locations of hazardous operations and materials (and their limits) authorized for the facility that are controlled by the *Health & Safety Manual and/or Environmental Compliance Manual*. For each operation or activity, briefly describe the associated hazards and reference the section(s) from the *Health & Safety Manual and/or Environmental Compliance Manual* that addresses the hazard. See the following example:

X-ray-emitting equipment that complies with x-ray machine safety criteria as set forth in *Health & Safety Manual*, Chapter 33. X-ray-emitting equipment is located in rooms _____ and _____.

List any special safety controls or restrictions (e.g., location of cut-off switches, grounding hooks) specific to the operation. In addition, add the pertinent section(s) of the manuals to the required reading list (see Appendix G). List the specific training requirements for the operations and activities in Section 5, "Training Requirements."]

4.2 Authorized Operations; Hazards and Their Controls

The hazardous operations and their necessary controls that required the issuance of this FSP and are hereby authorized by this procedure are listed below. [Using the following

guidelines, identify the classes of operations and materials (including their limits), the hazards associated with those classes, and the applicable controls.]

Operations. [Describe only those operations and activities not adequately covered in the *Health & Safety Manual* and/or in the *Environmental Compliance Manual*. Identify the specific locations of hazardous operations/activities and equipment.]

Hazards. [State the potential consequence(s) of the particular operation identified above. The question to be answered in this section is “If I were to conduct operations without safety controls, what would be the potential consequences”? For example, if an electrical shock hazard exist from a 30-kV power supply, the analysis shall state whether a potential shock may have fatal, serious, or minor consequences. Similarly, the consequences from a high-pressure hazard may result in a fatality or can cause severe injury to operating personnel if the pressure system or line were to rupture. If an explosion is the potential hazard, would it be completely contained by a vessel; or could it destroy the vessel or part of the room and injure operating personnel?

If a Safety Analysis Document has been written for the facility, it should describe the hazards (including the consequences outside the facility) and specify bounding accident scenarios. This information should be supplemented by the information developed in Appendix B, Table B-1, of this Supplement and Section 2.21 and Appendix 2-C of Chapter 2 of the *Health & Safety Manual*, or other hazard analysis used to assess hazards and their potential consequences to personnel. Be specific when quantifying these items.

If monitoring of exposure levels is included in the controls, the limits (PELs, TLVs, STELs, etc.) should be discussed in this section. Where there is a difference between Federal OSHA, California OSHA, or the American Conference of Governmental Industrial Hygienist (ACGIH) exposure limits to chemicals and physical agents, the more stringent limit applies.

Contact your ES&H team for assistance in stating the potential consequences of each identified hazard.]

Controls. [State the controls for each of the hazards identified above. Each control should be specific and contain both action and reaction (e.g., if you say, “Survey the area upon completion of the job,” state what to do if contamination is found).

When addressing the items in Table B-1 (Appendix B), state the limitations of voltage, quantity, pressure, temperature, and concentrations that are vital to the control of the hazardous materials involved. Describe the necessary controls for shipping, receiving, and storing such material and specify any protective clothing to be worn. If an Engineering Safety Note has been prepared, include a summary of the design parameters that established the system’s limitations; be sure to list the safety note in the reference section.

Notify the health and safety technician if there are significant changes to the location of the material so that he/she can update the “run cards” used by the Fire Department when responding to emergency calls.

Operations with hazardous chemicals are regulated by the OSHA Health Hazard Communication Standard. Guidelines for implementing this standard and the controls necessary for the safe handling of hazardous chemicals are given in Chapter 21 and its supplements of the *Health & Safety Manual*. FSPs must provide specific controls and limits that ensure compliance with this standard, including regulatory requirements (OSHA, DOE, and the EPA). Contact your ES&H team for assistance with developing adequate controls for each identified hazard.]

Reference the training listed in Section 5 as one of the administrative controls for the facility.

Special Considerations. [Identify any operation or material that is within the scope of this FSP. Require prior review of this procedure by the Facility Manager and the ES&H team leader before the operation begins or before materials are brought into the facility. Include the reason for this requirement.]

5. Training Requirements

[Specify who is responsible for ensuring that employees complete facility-required training and that training records are maintained. (General ES&H courses, on-the-job training courses, and recordkeeping requirements are provided in the *LLNL Training Program Manual*, *LLNL Course Catalog*, and in Chapter 7 of the *Health & Safety Manual*). If facility-specific training and recordkeeping requirements are provided in a directorate training program plan, reference the appropriate sections of that document. Specify any facility orientation and/or training for newly assigned employees (e.g., janitors) and any special requirements for summer students, visitors, and supplemental labor.

Specify the conditions, if any, under which untrained personnel can participate in hazardous operations. State how personnel working in the facility will be informed about the FSP rules and requirements governing operations.

In the section on required reading, identify FSPs and OSPs, material safety data sheets (MSDSs), emergency plans, chapters or sections of the *Health & Safety Manual*, and other documents that specifically pertain to the operation.]

6. Maintenance, Inspection, and Quality Assurance of Safety Systems, Environmental Systems, and Equipment

[The FSP shall identify and establish maintenance, inspection, and quality assurance (QA) requirements for systems or equipment important to safety (hereafter referred to as safety systems) and environmental protection, or equipment not covered by existing codes and standards. Tables B-4 and B-5 in Appendix B should be used as a starting point for identifying maintenance and QA requirements. Additional guidance is given in Section 4 of the *LLNL Maintenance Program Guidance Manual*.

Specify the required preventive maintenance and who in the facility is responsible for ensuring that maintenance is performed. Because safety systems support programmatic operations, address the controls that will be used to ensure that

programmatic operations are shut down (if necessary). Maintenance requirements may be provided in an appendix to the FSP. If a facility-specific maintenance manual exists or maintenance is performed by Plant Engineering, refer to the appropriate sections in the applicable manual.

Specify the QA requirements for the safety systems (i.e., state the inspection, testing, and surveillance methods) used to ensure the quality of facility systems important to safety and environmental protection. Specify the corrective action system to be used in the facility for identifying and repairing defective components, restoring systems to operation, and tracking deficiencies in safety systems. Identify the individual in the facility responsible for the QA of safety systems. Reference applicable sections of the QA plan and procedures if they exist. Review the surveillance requirements in applicable TSRs (listed in the relevant safety analysis report or document) and ensure that these requirements are included in this section.]

7. Emergency Response Plan and Procedures

[Identify possible emergencies that are unique to this facility, and include in the FSP a plan to respond to these emergencies.]

8. References

[List any pertinent references (e.g., hazards analyses, safety analysis documents, and Engineering Safety Notes).]

Appendices

[Appendices may be included as part of the FSP to provide supplementary information. Changes to appendices may be made as needed (e.g., to update the emergency callout list) without requiring a separate authorizing signature. The examples below may be cited by reference.

- A. Building floor plans
- B. List of organizations operating in the facility and area supervisors
- C. Emergency callout list
- D. Emergency response procedures
- E. Self-help plan [see Chapter 3 of the *Health & Safety Manual*.]
- F. Spill contingency plan
- G. Required reading list
- H. Other]